Halogen Free, High Tg, Low Transmission Loss Multilayer Material

MCL-LW-900G/910G GWA-900G/910G〈Prepreg〉

Low Dielectric constant Glass Thermosetting Resin Multilayer Material

■Features

- ●MCL-LW-910G achieved low dielectric constant (3.3 at 10GHz) and low dissipation factor (0.0028 at 10GHz) using low Dk glass and HVLP copper.
- ●MCL-LW-910G enables the high-speed transmission/communication of 25Gbps by the low transmission loss.
- ●MCL-LW-910G has excellent heat resistance, connection reliability.

■Applications

- ●High-speed computer, server
- ●High-speed Router
- ●High Frequency Devices, Antenna

■Standard Specifications

Part Number	Type	Copper Foil Thickness	Code Name	Actual Thickness and Tolerance
MCL-LW-900G (E glass cloth) MCL-LW-910G (Low Dk glass cloth)	—	18μm 35μm 70μm (RT) 12μm 18μm 35μm (HVLP)	M0.05	0.05±0.02mm
			M0.06	0.06±0.02mm
			M0.08	0.08±0.02mm
			0.1	0.10±0.02mm
			M0.11	0.10±0.02mm
			0.13	0.13±0.03mm
			M0.15	0.15±0.03mm
			0.2	0.20±0.03mm
			0.26	0.25±0.04mm

Note 1) In case laminate thickness lies in between two thickness figures shown above, the tolerance of such laminate would be equal to the tolerance of the thicker one.
Note 2) Please inquire about the line-up except the above.

■Characteristics

●Thin Laminate

(t0.8mm)

Item		Condition *3	Unit	Actual Value		Test Method (IPC-TM-650)
				MCL-LW-900G	MCL-LW-910G	
Tg		TMA	℃	190～210		2.4.24
		DMA		240～280		—
CTE *1	X	(30～120℃)	ppm/℃	12～15		2.4.24
	Y			12～15		
	Z	(<Tg)		35～45		
		(>Tg)		240～290		
Solder Heat Resistance (260℃)		A	sec.	>300		2.4.24.1
T-260 (Without Copper)		TMA	min.	>60		
T-288 (Without Copper)				>60		
Decomposition Temperature (5% Weight Loss)		TGA	℃	370～390		2.3.40
Copper Peel Strength	18μm RT	A	kN/m	0.6～0.8		2.4.8
	18μm HVLP			0.5～0.7		
Flexural Modulus (Lengthwise)		A	GPa	16～21		2.4.4
Dielectric Constant	1GHz*2	C-96/20/65	—	3.50～3.70	3.20～3.40	JPCA TM-001
	10GHz*2			3.40～3.60	3.20～3.40	
Dissipation Factor	1GHz*2	C-96/20/65	—	0.0025～0.0035	0.0020～0.0030	
	10GHz*2			0.0040～0.0050	0.0025～0.0035	
Volume Resistivity		C-96/20/65+C-96/40/90	Ω·cm	1×10^{14}～1×10^{16}		2.5.17
Surface Resistance		C-96/20/65+C-96/40/90	Ω	1×10^{13}～1×10^{15}		
Insulation Resistance		C-96/20/65	Ω	1×10^{14}～1×10^{16}		—
		C-96/20/65+D-2/100		1×10^{13}～1×10^{15}		—
Water Absorption		E-24/50+D-24/23	%	0.2～0.4		2.6.2.1
Flammability		A	—	V—0		UL94

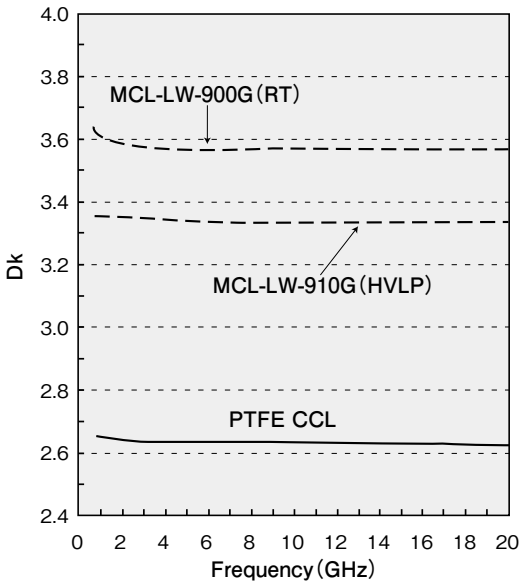
*1) Heating Rate: 10℃/min. *2) Measured by Triplate-line Resonator. *3) Refer to last page "Condition Note"

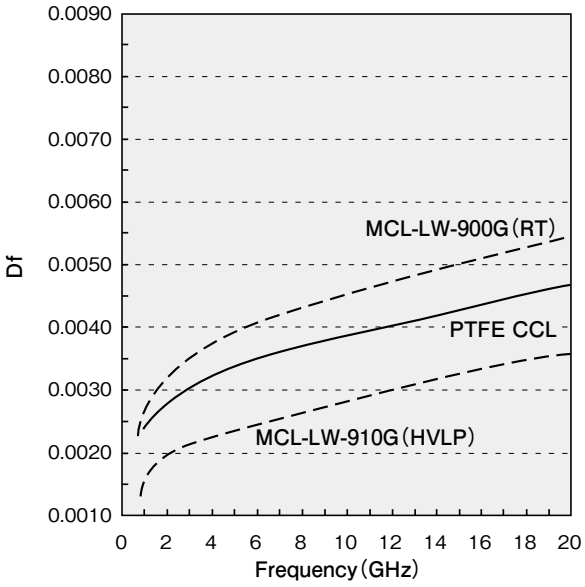
●Prepreg

Part Number	Type		Glass Cloth		Properties		
			Style	Yarn Count (warp×fill)	Resin Content (%)	Volatile Content (%)	Dielectric Thickness after Lamination *1 (mm)
GWA-900G	0.05	(1037N72)	1037	69×72	72±2	≦2.0	0.050
	0.06	(1078N65)	1078	53×53	65±2		0.078
	0.08	(3313N57)	3313	60×62	57±2		0.106
	0.1	(2116N55)	2116	60×58	55±2		0.125
GWA-910G	0.05	(1037N74)	1037	69×72	74±2		0.050
	0.06	(1078N67)	1078	53×53	67±2		0.078
	0.08	(2013N59)	2013	69×76	59±2		0.106
	0.1	(2116N57)	2116	60×58	57±2		0.125
Test Method (IPC-TM-650)					2.3.16	2.3.19	−

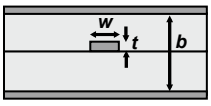
*1) The dielectric thickness after lamination is defined as the thickness of one sheet of prepreg when the resin flow is 0%.
This value changes depending on the press condition or inner layer pattern.
Note) Please inquire about the line-up other than the above.

●Dielectric characterization results

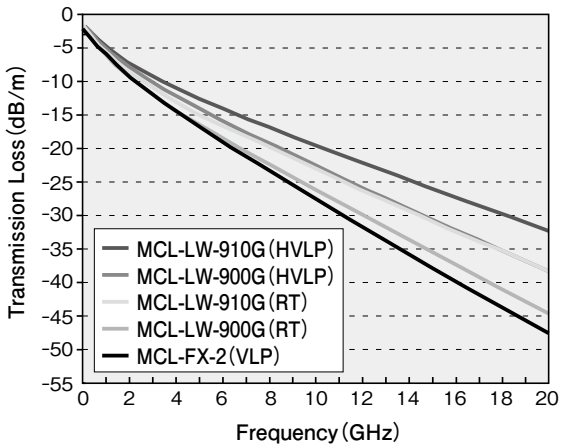




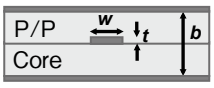
《Measurement Conditions》
・Method : Triplate-Line Resonator (JPCA-TM001)
・Temperature & Humidity : 25℃/60%RH
・Laminate Thickness (b) : 1.6mm (Signal-Ground : 800μm), Trace thickness (t): 18μm (RT,HVLP)
・Signal Conductor Line Width (w) : 1mm (Zo:ca.50Ω)



●Transmission Loss



《Measurement conditions》
・Evaluation PWB : Strip-line
・Temperature & Humidity : 25℃/60%RH
・Characteristic impedance : Approx. 50Ω
・Inner layer surface treatment : Black-reduction
・Proofreading method : TRL (Thru-Reflect-Line)



●Trace width (w) : 0.120mm
●Dielectric thickness (b) : 0.25mm
●Trace thickness (t) : 18μm